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In the claims:

Please amend claims 1 and 17 as follows:

- 5 1. (currently amended) A direct converter comprising:
an input buffer coupled to receive a stream of pixels in a Bayer pattern wherein each
pixel location has no more than one of a red (R) pixel, a blue (B) pixel, and a
green (G) pixel;
a luminance calculator, coupled to receive an input block of the pixels from the input
10 buffer, the input block including a plurality of green pixels and at least one blue
pixel and at least one red pixel in the Bayer pattern, the luminance calculator
generating from the green, red, and blue pixels in the input block a luminance
pixel for a pixel location within the input block;
a luminance buffer for storing a plurality of luminance pixels generated by the luminance
15 calculator including a luminance block of luminance pixels that has at least some
pixel locations that correspond to pixel locations within the input block; and
a chrominance calculator, coupled to both the input buffer and to the luminance buffer,
receiving at least two red pixels and at least two blue pixels within the input
block, and receiving the luminance block of luminance pixels from the luminance
20 buffer, the chrominance calculator calculating a first chrominance value from an
average of the at least two blue pixels and from the luminance block of luminance
pixels and a second chrominance value from an average of the at least two red
pixels and from the luminance block of luminance pixels,
whereby luminance and chrominance values are calculated directly from the red, green,
25 and blue pixels in the Bayer pattern.
2. (original) The direct converter of claim 1 wherein missing R, G, B color components
in the Bayer pattern are not generated by interpolation but luminance and chrominance
values are directly generated from the Bayer pattern without interpolation of R, G, B
30 pixels to generate missing R, G, B pixels.

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3. (original) The direct converter of claim 2 wherein the chrominance calculator further comprises:
a luminance averager, receiving the luminance block of luminance pixels, for generating an average luminance of the luminance block;
5 a chrominance generator that receives the average luminance from the luminance averager and receives blue pixels from the input buffer, the chrominance generator combining the average luminance and the blue pixels to generate the first chrominance value, the chrominance generator receiving the average luminance and the red pixels from the input buffer and combining the average
10 luminance and the red pixels to generate the second chrominance value, whereby the average luminance is generated and used as an intermediate when generating the first and second chrominance values.
4. (original) The direct converter of claim 3 wherein green pixels do not contribute to
15 the first chrominance value or to the second chrominance value except for contributing to the average luminance, whereby the chrominance generator does not include contributions from green pixels in the input block but only from red or blue pixels from the input block.
- 20 5. (original) The direct converter of claim 4 wherein the first chrominance value is a U pixel and the second chrominance value is a V pixel and the luminance pixel is a Y pixel in a YUV format.
6. (original) The direct converter of claim 2 wherein the input block is at least a 3x3
25 block of at least three rows and three columns of pixels in the Bayer pattern; wherein the luminance pixel generated by the luminance calculator is at a central pixel location surrounded by other luminance pixels in the luminance block.
7. (original) The direct converter of claim 6 wherein the luminance block is a same size
30 as the input block.

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8. (original) The direct converter of claim 7 wherein the luminance block corresponds to same pixel locations as the input block.

9. (original) The direct converter of claim 6 wherein the chrominance calculator is
5 activated for fewer pixel locations than the luminance calculator;
wherein more luminance pixels are generated than first chrominance values and more
luminance pixels are generated than second chrominance values.

10. (original) The direct converter of claim 2 wherein the chrominance calculator is
10 activated only when a central pixel location within the input block has a green pixel and
not a red pixel and not a blue pixel.

11. (original) The direct converter of claim 2 wherein the luminance calculator
multiplies each pixel in the input block by a corresponding coefficient in a
15 coefficient block to produce intermediate products;
wherein the luminance calculator sums the intermediate products to generate the
luminance pixel.

12. (original) The direct converter of claim 11 wherein the coefficient block is selected
20 from a plurality of four coefficient blocks based on a pattern of the R, G, and B pixels in
the input block.

13. (original) A method for directly generating YUV pixels from red (R), green (G),
blue (B) pixels in an un-interpolated pattern comprising:
25 receiving an input block of at least 3 rows of at least 3 pixels per row of R, G, and B
pixels in the un-interpolated pattern wherein each pixel location in the un-
interpolated pattern is a partial pixel that is missing at least one of the R, G, and B
color components;
determining a pattern type for the input block and selecting a selected coefficient block in
30 response to the pattern type;

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multiplying the input block by the selected coefficient block and summing to generate a
 Y component that represents an average brightness at a center of the input block;
 generating and storing Y components for each pixel location;
 reading stored Y components for locations in the input block and generating an average Y
 5 value for the input block from Y components;
 reading at least two B pixels from the input block;
 generating a U component from the at least two B pixels and from the average Y value
 while ignoring R and G pixels from the input block;
 reading at least two R pixels from the input block; and
 10 generating a V component from the at least two R pixels and from the average Y value
 while ignoring B and G pixels from the input block;
 wherein the U and V components represent color of a YUV pixel while the Y component
 represents brightness of the YUV pixel.
 whereby R, G, B pixels in the un-interpolated pattern are directly converted to Y, U, and
 15 V components of YUV pixels without RGB interpolation.

14. (original) The method of claim 13 wherein generating the U component and
 generating the V component occur when a center pixel in the input block is a G pixel, but
 do not occur when the center pixel is a R or a G pixel.

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15. (original) The method of claim 13 wherein the average Y value is an equal-weighted
 average of all Y components in pixel locations of the input block.

16. (original) The method of claim 13 wherein the un-interpolated pattern is a Bayer
 25 pattern wherein each pixel location is a mono-color pixel that is missing two of the R, G,
 and B color components.

17. (currently amended) A color-space converter comprising:
 input buffer means, receiving red (R), green (G), and blue (B) mono-color pixels arrayed
 30 in a pattern representing an image, for storing an input block of at least 3 lines of
 at least 3 mono-color pixels per line;

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- luminance calculator means, examining a pattern of the R, G, B pixels in the input block to determine a coefficient block, for multiplying the R, G, and B pixels in the input block by the coefficient block to generate a luminance component for a center pixel location within the input block;
- 5 luminance storage means, receiving luminance components from the luminance calculator means, for storing luminance components for pixel locations in a YUV color space representing the image; and
- chrominance calculator means, ~~receiving at least~~ receiving at least two B pixels from the input block and receiving at least two R pixels from the input block, for
- 10 generating a U chrominance component for the center pixel location within the input block by averaging the at least two B pixels and averaging at least 9 luminance components from the luminance storage means for pixel locations within the input block, and for generating a V chrominance component for the center pixel location within the input block by averaging the at least two R pixels
- 15 and averaging at least 9 luminance components from the luminance storage means for pixel locations within the input block,
- whereby Y, U, and V components are generated directly from the R, G, and B mono-color pixels in the input block without generation of multi-color RGB pixels.
- 20 18. (original) The color-space converter of claim 17 wherein the luminance calculator means and the chrominance calculator means are programmable means in a digital-signal processor (DSP) or in an associative array processor.
19. (original) The color-space converter of claim 17 wherein the input block is exactly 3
- 25 by 3 pixels and the center pixel location is a middle location.
20. (original) The color-space converter of claim 17 wherein the chrominance calculator means includes difference means for generating a U difference and a V difference by subtracting an average of the at least 9 luminance components from an average
- 30 of the at least two B pixels or the at least two R pixels;

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wherein the chrominance calculator means further includes constant means for multiplying the U difference by a first constant to generate the U chrominance component, and for multiplying the V difference by a second constant to generate the U chrominance component.

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